Application No. 09/681,108

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Canceled)

2. (Canceled)

3. (Canceled)

4. (Canceled)

5. (Currently Amended) [[The apparatus according to claim 2,]] An apparatus for reconstructing color filter array images, comprising:

an image recording module for generating an image of spatially consistent sampled values output from a color filter array; each of a plurality of pixels in the image having a location at which a sampled value of only one of a plurality of color channels is recorded; and

an image reconstruction module for linearly transforming the sampled value at the location of a selected one of the plurality of pixels in the image to estimate a color channel not recorded by the image recording module at the location of the selected pixel in the image;

wherein the image reconstruction module computes coefficients of a linear transformation using color channels of sampled values of the plurality of pixels in the image without interpolating values of other color channels of the plurality of pixels not recorded in the image by the image recording module; and

wherein the image reconstruction module fits the linear transformation to at least one pair of sums of color channels that are summed along lines through a window of the image.

6. (Canceled)

7. (Previously Presented) The apparatus according to claim 24, wherein the image reconstruction module fits the pair of sets of color channel sums using least

Application No. 09/681,108

squares linear regression.

8. (Previously Presented) The apparatus according to claim 5, wherein the image reconstruction module determines one or more of a confidence and a variance measure for the sums of the color channels.

9. (Currently Amended) The apparatus according to claim 5, wherein the reconstruction module computes the <u>pair of</u> sums of color channels along lines of columns or rows, or a combination thereof, of the window.

10. (Canceled)

11. (Canceled)

12. (Canceled)

13. (Canceled)

14. (Canceled)

15. (Currently Amended) [[The method according to claim 12,]] <u>A method for reconstructing color filter array images, comprising:</u>

<u>recording an image of spatially consistent sampled values output from a color filter array; each of a plurality of pixels in the image having a location at which a sampled value of only one of a plurality of color channels is recorded;</u>

<u>computing coefficients of a linear transformation using color channels of sampled values of the plurality of pixels in the image without interpolating values of other color channels of the plurality of pixels not recorded in the image; and</u>

<u>using the linear transformation and the sampled value at the location of a selected one of the plurality of pixels in the image to estimate a color channel not recorded at the location of the selected pixel in the image;</u>

wherein said computing further comprises fitting the linear transformation to at least one pair of sums of color channels that are summed along lines through a window of the image.

16. (Canceled)

17. (Previously Presented) The method according to claim 26, further comprising fitting the pair of sets of color channel sums using least squares linear

Application No. 09/681,108

regression.

18. (Previously Presented) The method according to claim 15, wherein one or more of a confidence and a variance measure are determined for the sums of the color channels.

19. (Currently Amended) The method according to claim 15, wherein the pair of sums of color channels is computed along lines of columns or rows, or a combination thereof, of the window.

20. (Canceled)

21. (Canceled)

22. (Currently Amended) ~~The method according to claim 21, further comprising estimating the coefficients of the linear transformation at (c)~~ A method for reconstructing color filter array images, comprising:

(a) acquiring an image using a color filter array that records spatially consistent samples of a plurality of color channels with only one sample of different ones of the plurality of color channels being recorded at each pixel in the image;

(b) assigning a selected pixel in the image to a window;

(c) using the color channels of recorded samples to estimate coefficients for a linear transformation for the window assigned to the selected pixel in the image without interpolating values of color channels not recorded in the image by fitting the linear transformation to at least one pair of sums of color channels that are summed along lines through the window assigned to selected pixel in the image;

(d) estimating a value for one or more of the plurality of color channels not recorded at the selected pixel location with (i) the recorded sample at the selected pixel location and (ii) the linear transformation for the window assigned to the selected pixel; and

(e) repeating (b), (c) and (d) for other selected pixels in the image.

23. (Previously Presented) The apparatus according to claim 8, wherein the image reconstruction module selects rows or columns of the window that have a low variance within their sum of color channels and determines with a confidence measure which of sums of the rows or columns of the window to select to fit a line

-5-

PAGE 10/28 * RCVD AT 8/17/2005 4:59:19 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/1 * DNIS:8729306 * CSID:+6508124274 * DURATION (mm-ss):09-16

Application No. 09/681,108

thereto.

24. (Previously Presented) The apparatus according to claim 9, wherein the image reconstruction module computes the pair of sums of color channels along rows and columns of a window by (a) determining sums of pixel values of two color channels along those rows and columns of the window that contains samples of both color channels, and (b) fitting a line to the sums of pixels values corresponding to one color channel against the sums of pixel values corresponding to the other color channel.

25. (Previously Presented) The method according to claim 18, further comprising:

selecting rows or columns of the window that have a low variance within their sum of color channels; and

determining with a confidence measure which of sums of the rows or columns of the window to select to fit a line thereto.

26. (Previously Presented) The method according to claim 19, [[further]] wherein the pair of sums of color channels is computed along rows and columns of a window by (a) determining sums of pixel values of two color channels along those rows and columns of the window that contains samples of both color channels, and (b) fitting a line to the sums of pixels values corresponding to one color channel against the sums of pixel values corresponding to the other color channel.

Please add the following new claims:

27. (New) The method according to claim 22, wherein one or more of a confidence and a variance measure are determined for the sums of the color channels.

28. (New) The method according to claim 27, further comprising:

selecting rows or columns of the window that have a low variance within their sum of color channels; and

determining with a confidence measure which of sums of the rows or columns

-6-

Application No. 09/681,108

of the window to select to fit a line thereto.

29. **(New)** The method according to claim 22, wherein the pair of sums of color channels is computed along lines of columns or rows, or a combination thereof, of the window.

30. **(New)** The method according to claim 29, wherein the pair of sums of color channels is computed along rows and columns of a window by (a) determining sums of pixel values of two color channels along those rows and columns of the window that contains samples of both color channels, and (b) fitting a line to the sums of pixels values corresponding to one color channel against the sums of pixel values corresponding to the other color channel.

31. **(New)** The method according to claim 30, further comprising fitting the pair of sets of color channel sums using least squares linear regression.